

# A self-consistent determination of the temperature profile and the magnetic field geometry in winds of late-type stars

A. A. Vidotto, D. Falceta-Gonçalves and V. Jatenco-Pereira  
*Depto. de Astronomia - Univ. de São Paulo - Brazil (aline@astro.iag.usp.br)*

February 5, 2008

**Abstract.** Cool giant and supergiant stars generally present low velocity winds with high mass loss rates. Several models have been proposed to explain the acceleration process of these winds. Although dust is known to be present in these objects, the radiation pressure on these particles is ineffective in reproducing the observed physical parameters of the wind. The most promising acceleration mechanism cited in the literature is the transference of momentum and energy from Alfvén waves to the gas. Usually, these models consider the wind to be isothermal. We present a stellar wind model in which the Alfvén waves are used as the main acceleration mechanism, and determine the temperature profile by solving the energy equation taking into account both the radiative losses and the wave heating. We also determine self-consistently the magnetic field geometry as the result of the competition between the magnetic field and the thermal pressures gradient. As main result, we show that the magnetic geometry present a super-radial index in the region where the gas pressure is increasing. However, this super-radial index is greater than that observed for the solar corona.

**Keywords:** stars: mass loss, stars: magnetic fields, MHD, waves

## 1. Introduction

After decades of theoretical and observational studies of cool giant and supergiant stars, the mechanisms by which the wind acceleration occurs are still poorly understood. Compared to the Sun, these stars are known to present continuous mass loss process occurring at high rates, typically  $10^{-10} - 10^{-5} \text{ M}_\odot \text{ yr}^{-1}$ , but in low velocity winds ( $u_\infty < 300 \text{ km s}^{-1}$ ) (Dupree 1986, Lamers & Cassinelli 1999). Radiative pressure on grains transfers momentum to these particles being responsible for their acceleration and, if gas and dust are dynamically well coupled, grains drag the gas outwards resulting in the mass ejection. However, for stationary envelopes (*e.g.* pre-AGB phase) dust driven theoretical models have lately failed in reproducing the wind properties, mainly because the dust-gas coupling is not effective (Sandin & Hofner 2003). Observationally, Guandalini *et al.* (2005) found no strong correlation between the mass loss rates and the luminosities of AGB stars. Their main conclusion is that, if radiative pressure is important in powering these



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

stellar winds, it must occur in addition to other mechanism. Another drawback to the radiation pressure models is the need for the dust formation region to be close to the star. Recent high resolution Doppler measurements show that winds are mainly accelerated near the stellar surface ( $r < 1.3 R_\star$ ) (Airapetian, Carpenter & Ofman 2003), while grains are expected to grow and survive at even larger distances.

In this sense, another mechanism must be used to accelerate the gas near surface. The most promising mechanism for the winds of cool stars is the transference of momentum and energy to the wind from MHD waves. Hartmann & MacGregor (1980) showed that it would be possible to reproduce the observed low wind velocities and the high mass loss rates of the cool giant and supergiant stars if some kind of wave damping mechanism is effective at the wind basis ( $r < 2 R_\star$ ). Jatenco-Pereira & Opher (1989) studied the effects of different damping mechanisms and magnetic field divergence and they showed that the magnetic field divergent geometry can rapidly dilute the wave flux and also slow down the wind. Their magnetic field geometry was based on empirical relations found from observations of the solar wind. This because in general, in lack of direct measurements of the magnetic field fluctuations and structure in other stars, we have to simply extrapolate our knowledge from solar observations.

In this work, we model the acceleration and heating of a late-type supergiant stellar wind considering an outward flux of Alfvén waves. We solve the MHD equations to, self-consistently, determine the magnetic field geometry and the wind temperature and velocity profiles. In section 2, we describe the model basic equations. In section 3 we present the results and the discussions, followed, by the work conclusions.

## 2. The Model

The basic wind equations are based on mass, momentum, energy and magnetic flux conservation. The first is given by  $\rho u A(r) = \rho_0 u_0 A(r_0)$ , where  $u$  is the flow velocity,  $\rho$  is the gas density and  $A(r)$  is the flow cross-section area at a distance  $r$  from the center of the star. The index “0” indicates the variable is being evaluated at the stellar surface.

Assuming a steady flow, the momentum equation can be written as:

$$\rho(\vec{u} \cdot \vec{\nabla})\vec{u} = -\frac{\rho GM_\star}{r^3}\vec{r} - \vec{\nabla} \left( P + \frac{\langle (\delta B)^2 \rangle}{8\pi} \right) + \frac{1}{4\pi}(\vec{\nabla} \times \vec{B}) \times \vec{B}, \quad (1)$$

where  $P = \rho k_B T / m$  is the thermal pressure,  $k_B$  is the Boltzmann constant,  $T$  is the gas temperature,  $m$  is the mean mass per particle,  $G$  the gravitational constant and  $\delta B$  the wave magnetic field amplitude.

In Equation (1), the right hand side contains the gravitational force density and the thermal and wave pressure gradients, respectively. The last term represent the magnetic force. The wave amplitude ( $\delta B$ ) is related to the wave energy density ( $\epsilon$ ) by  $\epsilon = \langle (\delta B)^2 \rangle / (4\pi)$ .

## 2.1. THIN FLUXTUBE APPROXIMATION

Typically, considering magnetic field strengths  $> 1$  G, the wind basis is characterized by the relation  $\beta = P/(B^2/8\pi) \ll 1$ , *i.e.* the plasma is magnetically dominated. In this case, if we assume the wind to be initiated at funnels anchored at the stellar surface, which are surrounded by a plasma with lower magnetic field strength, the magnetic pressure inside will push the gas and the funnel field lines will expand. The funnel cross-section radius ( $\mathcal{R}$ ) will grow super-radially up to a limit value ( $\mathcal{R}_m$ ). This limiting cross-section radius depends both on the relation between external and internal magnetic field strengths and on the filling factor ( $\alpha$ ). As the area increases, the internal magnetic strength diminishes until the equilibrium between internal and external magnetic pressures is reached. If the internal magnetic field strength is much larger than the external, the flux tubes cross-section will depend on the filling factor only. The filling factor is the ratio between the area of the stellar surface covered by funnels and the total area. The averaged maximum area that a funnel could reach would be  $A_m = A(r_0)/\alpha$  or, in terms of the cross-section radius:  $\mathcal{R}_m = \mathcal{R}_0/\alpha^{1/2}$ . For the quiet Sun, the funnels that merge to form the coronal holes cover about 10% of the total surface.

In this work, at the wind basis, we assume the plasma to be magnetically dominated and the left hand side of Equation (1) may be neglected if compared to the other terms. Then, by using  $\vec{\nabla} \cdot \vec{B} = 0$  and a power series expansion method proposed by Pneuman, Solanki & Stenflo (1986), we can determine self-consistently the magnetic field geometry without assuming any empirical function for the funnel cross-section with distance.

Following Pneuman, Solanki & Stenflo (1986), using the thin flux-tube approximation, Equation (1) and  $\vec{\nabla} \cdot \vec{B} = 0$  are described near stellar surface, which in our model occurs up to  $\sim 1.4 r_0$ , by:

$$4\pi \frac{\partial P}{\partial y} \simeq B_r \left( \frac{\partial B_y}{\partial r} - \frac{\partial B_r}{\partial y} \right), \quad (2)$$

$$4\pi \left( \frac{\partial P}{\partial r} + \frac{P}{H} \right) \simeq -B_y \left( \frac{\partial B_y}{\partial r} - \frac{\partial B_r}{\partial y} \right), \quad (3)$$

and

$$\frac{1}{y} \frac{\partial}{\partial y} (y B_y) + \frac{\partial B_r}{\partial r} = 0, \quad (4)$$

where  $H = k_B T r^2 / G m M_\star$  is the scale height. The thin fluxtube approximation is reliable when the cross-section radius  $\mathcal{R}$  is negligible compared to both the scale height of the external medium and any variation scales along the tube (Spruit 1981; Longcope and Klapper 1997).

Expanding all variables as power series in  $y$  (*i.e.* along the tube radius), and neglecting terms of orders higher than 2, Equations (2) – (4) give rise to a differential equation for the fluxtube cross-section:

$$\begin{aligned} \frac{A(r_0)}{2H_0^2} \left[ \frac{\partial^2}{\partial r^2} \left( \frac{A(r_0)}{A(r)} \right) - \frac{1}{2A(r)} \frac{\partial}{\partial r} \left( \frac{A(r_0)}{A(r)} \right) \right] = \\ \left( \frac{A(r_0)}{A(r)} \right)^2 \left[ 1 - \left( \frac{B_{\text{ext}}}{B_0} \frac{(1-\alpha)}{\left( \frac{A(r_0)}{A(r)} - \alpha \right)} \right)^2 \right] + 2\beta \frac{P(r)}{P(r_0)}, \end{aligned} \quad (5)$$

where  $\beta = 4\pi P(r_0)/B_0^2$ ,  $\alpha$  is the filling factor and  $B_{\text{ext}}$  is the magnetic field strength outside the fluxtube. In the following calculations we fixed its value to be  $10^{-3} B(r)$ .

To simplify the set of equations, we will define the funnel area expansion as a function of radial distance by:  $A(r) = A(r_0)(r/r_0)^S$ , where  $S$  is the expansion index, which is super-radial ( $S > 2$ ) at the wind basis up to the merging radius when  $S$  becomes 2.  $S$  is determined from Equation (5).

## 2.2. THE WIND EQUATIONS

In a consistent model, to avoid assuming any empirical function for the magnetic field geometry and to determine the wind temperature at each wind position ( $r$ ), we have to solve the energy equation, which is determined from the balance between wave heating and the adiabatic expansion and radiative coolings (Hartmann, Edwards & Avrett 1982). Thus, neglecting conduction, we write the energy equation as:

$$\rho u \frac{d}{dr} \left( \frac{u^2}{2} + \frac{5}{2} \frac{k_B T}{m} - \frac{GM_\star}{r} \right) + \frac{u}{2} \frac{d\epsilon}{dr} = (Q - P_R), \quad (6)$$

where  $Q$  is the wave heating rate, *i.e.* the rate at which the gas is being heated due to dissipation of wave energy, and  $P_R$  is the radiative cooling rate, both in  $\text{erg cm}^{-3} \text{s}^{-1}$ . The wave heating can be written as  $Q = \epsilon(u + v_A)/L$  and the radiative cooling is given by  $P_R = \Lambda n_e n_H$ ,

where  $n_e$  is the electron density,  $n_H$  is the hydrogen density and  $\Lambda$  is the radiative loss function. Here, we adopt the  $\Lambda$  function given by Schmutzler & Tscharnutter (1993) and calculate  $n_e$  with the modified Saha equation given by Hartmann & MacGregor (1980).

The wave energy density at each step may be calculated using a WKB approximation, from the wave action conservation. This approximation can often be employed when the properties of the medium vary slowly on a scale comparable to the wavelength (Usmanov *et al.* 2000). Under this assumption, the wave energy density is dissipated as follows:

$$\epsilon = \epsilon_0 \frac{M_0}{M} \left( \frac{1 + M_0}{1 + M} \right)^2 \exp \left[ - \int_{r_0}^r \frac{1}{L} dr' \right], \quad (7)$$

where  $M = u/v_A$  is the Alfvén-Mach number,  $v_A = (B/\sqrt{4\pi\rho})$  the Alfvén speed and  $L$  the wave damping length. Also, the wave flux ( $\phi_A$ ) at  $r_0$  is evaluated by  $\phi_{A_0} = \epsilon_0 v_{A_0} (1 + 1.5M_0)$ . We consider the non-linear damping mechanism, which length is given by (Jatenco-Pereira & Opher 1989):

$$L = L_0 \left( \frac{v_A}{v_{A_0}} \right)^4 \frac{\langle (\delta v)^2 \rangle_0}{\langle (\delta v)^2 \rangle} (1 + M), \quad (8)$$

where  $\langle (\delta v)^2 \rangle$  is the averaged squared perturbation velocity amplitude and  $L_0$  is the damping length at the wind basis, which is mainly dependent on the assumed wave frequency spectrum (Lagage & Cesarsky 1983). Here, we will let it as a free parameter.

The equations presented here fully describe the wind parameters and the magnetic field geometry under the given assumptions. In the next section, we show the main results by applying these equations in a typical cool supergiant star and compare them with previous works.

### 3. Results and Discussions

For the last decades, the validity of a wind model was limited to simply reproduce the terminal velocity and the mass-loss rate of a given star. As a consequence, a number of accelerating mechanisms were found in accordance to observations. However, with the appearance of high resolution observations from more sensitive instruments, in the near future, the radial profiles of the wind parameters will become measurable and will be decisive on the choice of the wind model.

Here, we obtained the wind parameter profiles applying the described model on a cool supergiant star with  $M_* = 16 M_\odot$ ,  $r_0 = 400 R_\odot$ ,  $\rho_0 = 10^{-13} \text{ g cm}^{-3}$ ,  $B_0 = 10 \text{ G}$  and  $T_0 = 3500 \text{ K}$ , as used by

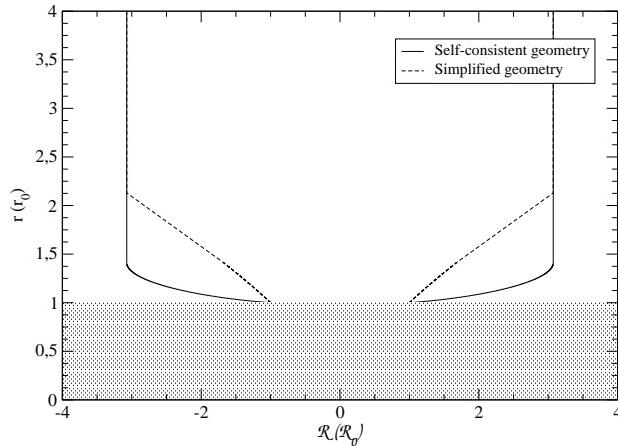


Figure 1. The magnetic field structure for a constant super-radial index  $S = 5$  (dashed line) and that determined self-consistently in our model (solid line).

Hartmann & MacGregor (1980) in their model star 4. We also assumed a filling factor  $\alpha = 0.1$ , according to solar observations. For these stars, observational data reveal typical mass-loss rates of  $\dot{M} \simeq 10^{-7} - 10^{-6} M_{\odot} \text{ yr}^{-1}$  and terminal velocities of  $u \simeq 70 \text{ km s}^{-1}$ . Unfortunately, the available data are limited in spatial resolution for most of the stars, and it is not possible to fit the complete radial profiles.

Assuming a surface magnetic field strength  $B_0 = 10 \text{ G}$ , an Alfvén waves flux of  $\phi_{A0} = 10^7 \text{ erg cm}^{-2} \text{ s}^{-1}$  at the wind basis and a low damped wave flux ( $L_0 = 5 r_0$ ), both the wind terminal velocity and the mass loss rate obtained were consistent with the observations. This value corresponds to a wave amplitude of  $\sqrt{\langle (\delta B)^2 \rangle} \simeq 3 \times 10^{-2} B_0$ , which is very plausible for a turbulent medium as that at the stellar surface (Suzuki & Inutsuka 2005).

The velocity and temperature profiles for this case are shown in Figure 2. The velocity profile reveals a peak of  $u > 100 \text{ km s}^{-1}$  at  $r < 2.0 r_0$ , and slightly decreases for larger distances until reaching the observed value. The temperature profile presents an initial negative gradient reaching temperatures  $T < 2500 \text{ K}$  in a narrow region. Also, near  $r = 1.5 r_0$  the temperature reaches the maximum value of  $\sim 6000 \text{ K}$ . For  $r > 3.0 r_0$ , where the wave heating and the radiative losses are low, the temperature decreases due to the adiabatic expansion.

#### 4. Conclusions

We propose a self-consistent wind model to determine the parameters profiles for a supergiant late-type star. To determine the magnetic

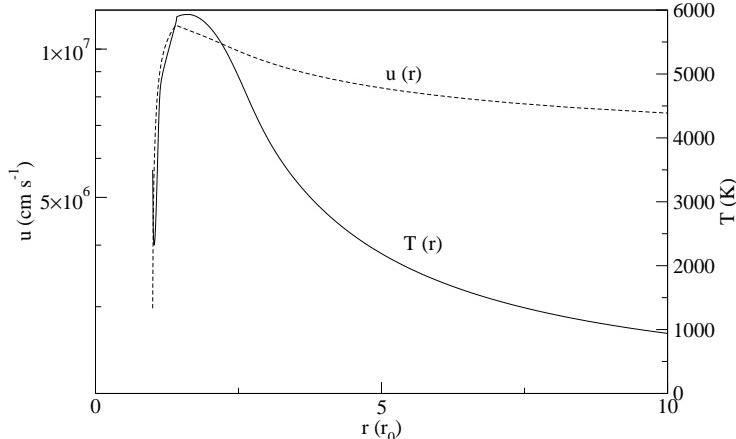


Figure 2. The wind velocity profile and the wind temperature profile for the best fitting parameters in the case of low damped waves.

field geometry we used an expansion method over the wind physical parameters as proposed by Pneuman, Solanki & Stenflo (1986). Near surface, the magnetic pressure inside the flux tubes are higher than that of the surrounding medium, forcing the field lines to curve. We found an initial super-radial expansion factor  $S > 30$  at the wind basis, much higher than the value used by previous authors (e.g. Jatenco-Pereira & Opher 1989, Bravo & Stewart 1997, Dobrzycka *et al.* 1999) that included empirical relations to account for the magnetic field geometry based on solar observations.

Considering a supergiant late-type star, we obtained the wind velocity and temperature profiles. Typically, Alfvén waves driven winds result in high velocity winds ( $u > 100 \text{ km s}^{-1}$ ), unless some strong wave damping mechanism takes place at the wind basis. We showed that this conclusion is correct in the case of low divergent magnetic field structures. In this work, the strong divergence is responsible for a rapid wave spatial dilution near surface, resulting in a lower wind velocity even for low damped waves.

The obtained results were consistent to the typical mass-loss rate ( $\dot{M} \simeq 10^{-7} - 10^{-6} M_{\odot} \text{ yr}^{-1}$ ) and the terminal velocity ( $u \simeq 70 \text{ km s}^{-1}$ ) observed for these objects. The velocity profile reveals an efficient acceleration at  $r < 1.5 r_0$ , reaching the maximum value  $\sim 100 \text{ km s}^{-1}$ . In this region the wind is mainly accelerated by the wave energy density and the thermal pressure gradients. Afterwards, the absence of the wave acceleration and the cooling gas result in a decrease of the velocity to the observed values. For the temperature, assuming a weakly damped wave flux, the radiative losses and the expansion

cooling are dominant near surface, and the temperature gradient is initially negative. The temperature falls to  $\simeq 2500$  K in a sharp region and then, as density decreases as the wind accelerates and the flux tube expands, it increases up to  $\simeq 6000$  K at  $r < 2.0 r_0$ . For higher distances, where the radiative losses are low and the wave heating is no longer effective, the temperature decreases mainly due to the adiabatic expansion.

Although the present calculations provided a new and interesting picture of the physical processes involving the heating and the acceleration mechanisms of cool stellar winds, the model presents a limitation. The wind equations were solved considering the thin fluxtube approximation. Mainly for a high divergence wind, a complete 2-D set of equations must be employed in order to obtain more precise results. This step should be concluded in the near future.

### Acknowledgments

A. A. Vidotto and D. Falceta-Gonçalves thank FAPESP for the financial support (04/13846-6 and 04/12053-2) and V. Jatenco-Pereira thanks CNPq (304523/90-9).

### References

- Airapetian, V. S., Carpenter, K. & Ofman, L. 2003, AAS, 202, 3214  
 Bravo, S. and Stewart, G. A. 1997, AdSpR, 20, 35  
 Dobrzycka, D. and Cranmer, S. R., Panasyuk, A. V. *et al.* 1999, JGR, 104, 9791  
 Dupree, A. K. 1986, ARA&A, 24, 377  
 Guandalini, R., Busso, M., Ciprini, S. *et al.* 2005, astro-ph 0509739  
 Hartmann, L. & MacGregor, K. B. 1980, ApJ, 242, 260  
 Hartmann, L., Edwards, S., & Avrett, E. 1982, ApJ, 261, 279  
 Jatenco-Pereira, V. & Opher, R. 1989, A&A, 209, 327  
 Lamers, H. J. G. L. M. & Cassinelli, J. P. 1999, Introduction to Stellar Winds ( New York: Cambridge Univ. Press)  
 Lagage, P. O. & Cesarsky, C. J. 1983, A&A, 125, 249  
 Longcope, D. W. & Klapper, I. 1997, ApJ, 488, 443  
 Pneuman, G. W., Solanki, S. K. & Stenflo, J. O. 1986, A&A, 154, 231  
 Sandin, C. & Hofner, S. 2003, A&A, 404, 789  
 Schmutzler, T., & Tscharnuter, W. M. 1993, A&A, 273, 318  
 Spruit, H. C. 1981, A&A, 98, 155  
 Suzuki, T. K., & Inutsuka, S. 2005, ApJL, 632, 49  
 Usmanov, A. V., Goldstein, M. L., Besser, B. P., & Fritzer, J. M. 2000, JGR, 105, 12675  
*Address for Offprints:* Depto. de Astronomia, Univ. de São Paulo, Rua do Matão, 1226, São Paulo, SP, 05508-900, Brazil

klu9.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options.

### Table of Contents

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	2
1.3	Textheight and textwidth	3
1.4	Lists	4
1.5	Float separation parameters	5



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klu9.clc}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This is identical to `\tiny` here. Allowed type provided values: 5/6, 6/7, 7/8, 8/9.5, 9/11, 10/12, 11/13, 12/14, 14/18, 17/22, 20/25.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize\@ixpt{11}%
4   \abovedisplayskip 8.5\p@ \oplus3\p@ \ominus4\p@
5   \abovedisplayshortskip \z@ \oplus2\p@
6   \belowdisplayshortskip 4\p@ \oplus2\p@ \ominus2\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\@viiipt{9.5}%
12   \abovedisplayskip 6\p@ \oplus2\p@ \ominus4\p@
13   \abovedisplayshortskip \z@ \oplus\p@
14   \belowdisplayshortskip 3\p@ \oplus\p@ \ominus2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 3\p@ \oplus\p@ \ominus\p@
17     \parsep 2\p@ \oplus\p@ \ominus\p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\@viiipt{8}%
23   \abovedisplayskip 4\p@ \oplus2\p@ \ominus2\p@
24   \abovedisplayshortskip \z@ \oplus\p@
25   \belowdisplayshortskip 2\p@ \oplus\p@ \ominus1\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 2\p@ \oplus\p@ \ominus\p@
28     \parsep 1\p@ \oplus\p@ \ominus\p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{\@setfontsize\scriptsize\@viiipt{8}%
33 \newcommand\little{\@setfontsize\little\@vpt\@viiipt}
34 \newcommand\tiny{\@setfontsize\tiny\@vpt\@viiipt}
35 \newcommand\large{\@setfontsize\large\@xpt\@xiipt}
36 \newcommand\Large{\@setfontsize\Large\@xiiipt{14}}
37 \newcommand\LARGE{\@setfontsize\LARGE\@xivipt{18}}
38 \newcommand\huge{\@setfontsize\huge\@xviipt{22}}
39 \newcommand\Huge{\@setfontsize\Huge\@xxipt{25}}
```

### 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
40 \setlength\hoffset{-1in}
41 \setlength\voffset{-1in}
42 \setlength\parindent {14\p@}
43 \setlength\headheight{12\p@}
```

```

44 \setlength\headsep    {12\p@}
45 \setlength\topskip    {10\p@}
46 \setlength\footskip   {25\p@}
47 \setlength\marginparsep{10pt}
48 \setlength\marginparpush{5\p@}
49 \setlength\maxdepth   {.5\topskip}
50 \setlength\@maxdepth\maxdepth
51 \setlength\columnsep{10pt}
52 \setlength\columnseprule{0pt}
53 \setlength\fboxsep{3pt}
54 \setlength\fboxrule{.4pt}

```

### 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘AtBeginDocument’ to allow changes made in the preamble and later on in the stylefile.

```

55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength{\tempdima}{\paperwidth}%
58   \addtolength{\tempdima}{-\textwidth}%
59   \divide{\tempdima}{2}
60   \setlength{\tempdimb}{\marginparwidth}
61   \addtolength{\tempdimb}{\marginparsep}
62   \addtolength{\tempdimb}{2pc}%
63   \ifdim \tempdima < \tempdimb
64     \settopoint{\tempdimb}
65     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
66       your \string\textwidth\space (\the\textwidth) and
67       \string\marginparwidth\space (\the\marginparwidth) too wide.\MessageBreak
68       The allowed value for margin space: (\the\tempdima). Needed value:
69       (\the\tempdimb).\MessageBreak
70       This is not enough,
71       so I will set \string\marginparwidth\space to Opt.\MessageBreak
72       Let's hope that fixes it.
73   }%
74   \marginparwidth \z@%
75   \marginparsep \z@
76 \fi
77 \ifdim \tempdima < 2pc
78   \tempdimb=\paperwidth
79   \advance{\tempdimb}{-4pc}
80   \settopoint{\tempdimb}
81   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
82     made your \string\textwidth\space (\the\textwidth)
83     wider than the available total\MessageBreak
84     (Which is: \the\tempdimb). Please press X and try again.
85   }%
86 \fi
87 \oddsidemargin \tempdima
88 \evensidemargin \tempdima

```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```

108 }%
109 \setlength\footnotesep{6\p@}
110 \setlength{\skip\footins}{9\p@ \oplus 4\p@ \minus 2\p@}

111 \setlength\partopsep{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{1.9em}
113 \setlength{\leftmarginii}{2em}
114 \setlength{\leftmarginiii}{1.7em}
115 \setlength{\leftmarginiv}{1.4em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

#### 1.4. LISTS

List default values

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 8\p@ \oplus 2\p@ \minus 2\p@
124   \partopsep 2\p@ \oplus 1\p@ \minus 1\p@
125   \itemsep 4\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 4\p@ \oplus 2\p@ \minus 1\p@ }
127 \def\@listii{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 2\p@ \oplus 1\p@ \minus 1\p@ }
133 \itemsep \parsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 8\p@ \oplus 2\p@ \minus 2\p@
124   \partopsep 2\p@ \oplus 1\p@ \minus 1\p@
125   \itemsep 4\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 4\p@ \oplus 2\p@ \minus 1\p@ }
127 \def\@listii{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 2\p@ \oplus 1\p@ \minus 1\p@ }
133 \itemsep \parsep}

```

```

134 \def\@listii{%
135   \leftmargin \leftmarginii
136   \labelwidth \leftmarginii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \oplus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \oplus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def\@listiv{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def\@listv{%
147   \setlength{\leftmargin}{\leftmarginv}%
148   \setlength{\labelwidth}{\leftmarginv}%
149   \addtolength{\labelwidth}{-\labelsep}}
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}}
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```

156 \setlength\floatsep{10\p@ \oplus 2\p@ \minus 2\p@}
157 \setlength\textfloatsep{18\p@ \oplus 2\p@ \minus 4\p@}
158 \setlength\intextsep{10\p@ \oplus 2\p@ \minus 2\p@}
159 \setlength\dblfloatsep{10\p@ \oplus 2\p@ \minus 2\p@}
160 \setlength\dbltextfloatsep{18\p@ \oplus 2\p@ \minus 4\p@}

```

Separation on float pages

```

161 \setlength\@fptop{0\p@ \oplus 1fil}
162 \setlength\@fpsep{8\p@ \oplus 2fil}
163 \setlength\@fpbot{0\p@ \oplus 1fil}
164 \setlength\@dblfpptop{0\p@ \oplus 1fil}
165 \setlength\@dblfpsep{8\p@ \oplus 2fil}
166 \setlength\@dblfpbot{0\p@ \oplus 1fil}
167
168 \endinput

```

klut9.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options. This is a ‘tight’ file.

### Table of Contents

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	2
1.3	Textheight and textwidth	3
1.4	Lists	4
1.5	Float separation parameters	5



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klut9.clo}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This is identical to `\tiny` here. Allowed type provided values: 5/6, 6/7, 7/8, 8/9, 9/10.5, 10/11.5, 11/13, 12/14, 14/18, 17/22, 20/25.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize\ixpt{10.5}%
4   \abovedisplayskip 8.5\p@ \oplus3\p@ \ominus4\p@
5   \abovedisplayshortskip \z@ \oplus2\p@
6   \belowdisplayshortskip 4\p@ \oplus2\p@ \ominus2\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\viipt{9}%
12   \abovedisplayskip 6\p@ \oplus2\p@ \ominus4\p@
13   \abovedisplayshortskip \z@ \oplus\p@
14   \belowdisplayshortskip 3\p@ \oplus\p@ \ominus2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 3\p@ \oplus\p@ \ominus\p@
17     \parsep 2\p@ \oplus\p@ \ominus\p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\viipt{8}%
23   \abovedisplayskip 4\p@ \oplus2\p@ \ominus2\p@
24   \abovedisplayshortskip \z@ \oplus\p@
25   \belowdisplayshortskip 2\p@ \oplus\p@ \ominus1\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 2\p@ \oplus\p@ \ominus\p@
28     \parsep 1\p@ \oplus\p@ \ominus\p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{@setfontsize\scriptsize\vipt\viipt}
33 \newcommand\little{@setfontsize\little\vpt\vipt}
34 \newcommand\tiny{@setfontsize\tiny\vpt\vipt}
35 \newcommand\large{@setfontsize\large\xpt{11.5}}
36 \newcommand\Large{@setfontsize\Large\xiipt{14}}
37 \newcommand\LARGE{@setfontsize\Large\xivpt{18}}
38 \newcommand\huge{@setfontsize\huge\xvpt{22}}
39 \newcommand\Huge{@setfontsize\Huge\xxpt{25}}
```

### 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
40 \setlength\hoffset{-1in}
41 \setlength\voffset{-1in}
42 \setlength\parindent {14\p@}
43 \setlength\headheight{12\p@}
```

```

44 \setlength\headsep    {12\p@}
45 \setlength\topskip    {10\p@}
46 \setlength\footskip   {25\p@}
47 \setlength\marginparsep{10pt}
48 \setlength\marginparpush{5\p@}
49 \setlength\maxdepth   {.5\topskip}
50 \setlength\@maxdepth\maxdepth
51 \setlength\columnsep{10pt}
52 \setlength\columnseprule{0pt}
53 \setlength\fboxsep{3pt}
54 \setlength\fboxrule{.4pt}

```

### 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘AtBeginDocument’ to allow changes made in the preamble and later on in the stylefile.

```

55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength{\tempdima}{\paperwidth}%
58   \addtolength{\tempdima}{-\textwidth}%
59   \divide{\tempdima}{2}
60   \setlength{\tempdimb}{\marginparwidth}
61   \addtolength{\tempdimb}{\marginparsep}
62   \addtolength{\tempdimb}{2pc}%
63   \ifdim \tempdima < \tempdimb
64     \settopoint{\tempdimb}
65     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
66       your \string\textwidth\space (\the\textwidth) and
67       \string\marginparwidth\space (\the\marginparwidth) too wide.\MessageBreak
68       The allowed value for margin space: (\the\tempdima). Needed value:
69       (\the\tempdimb).\MessageBreak
70       This is not enough,
71       so I will set \string\marginparwidth\space to Opt.\MessageBreak
72       Let's hope that fixes it.
73   }%
74   \marginparwidth \z@%
75   \marginparsep \z@
76 \fi
77 \ifdim \tempdima < 2pc
78   \tempdimb=\paperwidth
79   \advance{\tempdimb}{-4pc}
80   \settopoint{\tempdimb}
81   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
82     made your \string\textwidth\space (\the\textwidth)
83     wider than the available total\MessageBreak
84     (Which is: \the\tempdimb). Please press X and try again.
85   }%
86 \fi
87 \oddsidemargin \tempdima
88 \evensidemargin \tempdima

```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```

108 }%
109 \setlength\footnotesep{6\p@}
110 \setlength{\skip\footins}{9\p@ \oplus 4\p@ \minus 2\p@}

111 \setlength\partopsep{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{1.9em}
113 \setlength{\leftmarginii}{2em}
114 \setlength{\leftmarginiii}{1.7em}
115 \setlength{\leftmarginiv}{1.4em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

#### 1.4. LISTS

List default values

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 8\p@ \oplus 2\p@ \minus 2\p@
124   \partopsep 2\p@ \oplus 1\p@ \minus 1\p@
125   \itemsep 4\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 4\p@ \oplus 2\p@ \minus 1\p@ }
127 \def\@listii{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 2\p@ \oplus 1\p@ \minus 1\p@ }
133 \itemsep \parsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 8\p@ \oplus 2\p@ \minus 2\p@
124   \partopsep 2\p@ \oplus 1\p@ \minus 1\p@
125   \itemsep 4\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 4\p@ \oplus 2\p@ \minus 1\p@ }
127 \def\@listii{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 2\p@ \oplus 1\p@ \minus 1\p@ }
133 \itemsep \parsep}

```

```

134 \def\@listii{%
135   \leftmargin \leftmarginii
136   \labelwidth \leftmarginii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \oplus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \oplus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def\@listiv{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def\@listv{%
147   \setlength{\leftmargin}{\leftmarginv}%
148   \setlength{\labelwidth}{\leftmarginv}%
149   \addtolength{\labelwidth}{-\labelsep}}
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}}
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```

156 \setlength\floatsep{10\p@ \oplus 2\p@ \minus 2\p@}
157 \setlength\textfloatsep{18\p@ \oplus 2\p@ \minus 4\p@}
158 \setlength\intextsep{10\p@ \oplus 2\p@ \minus 2\p@}
159 \setlength\dblfloatsep{10\p@ \oplus 2\p@ \minus 2\p@}
160 \setlength\dbltextfloatsep{18\p@ \oplus 2\p@ \minus 4\p@}

```

Separation on float pages

```

161 \setlength\@fptop{0\p@ \oplus 1fil}
162 \setlength\@fpsep{8\p@ \oplus 2fil}
163 \setlength\@fpbot{0\p@ \oplus 1fil}
164 \setlength\@dblfpptop{0\p@ \oplus 1fil}
165 \setlength\@dblfpsep{8\p@ \oplus 2fil}
166 \setlength\@dblfpbot{0\p@ \oplus 1fil}
167
168 \endinput

```

## klu10.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options.**Table of Contents**

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	3
1.3	Textheight and textwidth	3
1.4	Lists	4
1.5	Float separation parameters	5



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klu10.clo}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 5/6, 6/7, 7/8, 8/9.5, 9/11, 10/12, 12/14, 14/18, 17/22, 20/25, 25/30.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize\@xipt\@xiipt
4   \abovedisplayskip 10\p@ \cplus 2\p@ \cminus5\p@
5   \abovedisplayshortskip \z@ \cplus 3\p@
6   \belowdisplayshortskip 6\p@ \cplus 3\p@ \cminus3\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\@listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\@ixpt{11}%
12   \abovedisplayskip 8.5\p@ \cplus3\p@ \cminus4\p@
13   \abovedisplayshortskip \z@ \cplus2\p@
14   \belowdisplayshortskip 4\p@ \cplus2\p@ \cminus2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 4\p@ \cplus2\p@ \cminus2\p@
17     \parsep 2\p@ \cplus\p@ \cminus\p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\@viiipt{9.5}%
23   \abovedisplayskip 6\p@ \cplus2\p@ \cminus4\p@
24   \abovedisplayshortskip \z@ \cplus\p@
25   \belowdisplayshortskip 3\p@ \cplus\p@ \cminus2\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 3\p@ \cplus\p@ \cminus\p@
28     \parsep 2\p@ \cplus\p@ \cminus\p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{\@setfontsize\scriptsize\@viiipt\@viiipt}
33 \newcommand\little{\@setfontsize\little\@vpt\@viiipt}
34 \newcommand\tiny{\@setfontsize\tiny\@vpt\@vpt}
35 \newcommand\large{\@setfontsize\large\@xiipt{14}}
36 \newcommand\Large{\@setfontsize\Large\@xivpt{18}}
37 \newcommand\LARGE{\@setfontsize\LARGE\@xviipt{22}}
38 \newcommand\huge{\@setfontsize\huge\@xxpt{25}}
39 \newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}
```

## 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```

40 \setlength{\hoffset}{-1.5cm}
41 \setlength{\voffset}{0pt}
42 \setlength{\parindent}{14\p@}
43 \setlength{\headheight}{12\p@}
44 \setlength{\headsep}{12\p@}
45 \setlength{\topskip}{10\p@}
46 \setlength{\footskip}{27.5\p@}
47 \setlength{\marginparsep}{10pt}
48 \setlength{\marginparpush}{5\p@}
49 \setlength{\maxdepth}{.5\topskip}
50 \setlength{\@maxdepth}{\maxdepth}
51 \setlength{\columnsep}{10pt}
52 \setlength{\columnseprule}{0pt}
53 \setlength{\fboxsep}{3pt}
54 \setlength{\fboxrule}{.4pt}
```

## 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘`AtBeginDocument`’ to allow changes made in the preamble and later on in the stylefile.

```

55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength{\tempdima}{\paperwidth}%
58   \addtolength{\tempdima}{-\textwidth}%
59   \divide{\tempdima}{2}%
60   \setlength{\tempdimb}{\marginparwidth}%
61   \addtolength{\tempdimb}{\marginparsep}%
62   \addtolength{\tempdimb}{2pc}%
63   \ifdim \tempdima < \tempdimb
64     \GenericError{\Pointsize}{Pointsize Error: Marginpars disabled}{You made
65     your \string{textwidth} space (\the\textwidth) and
66     \string{marginparwidth} (\the\marginparwidth) too wide.\MessageBreak
67     The allowed value for margin space: (\the\tempdima). Needed value:
68     (\the\tempdimb).\MessageBreak
69     This is not enough,
70     so I will set \string{marginparwidth} to 0pt.\MessageBreak
71     Let's hope that fixes it.
```

```

73   }%
74   \marginparwidth \z@
75   \marginparsep \z@
76 \fi
77 \ifdim \tempdima <2pc
78   \tempdimb=\paperwidth
79   \advance\tempdimb by -4pc
80   \settopoint\tempdimb
81   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{You
82   made your \string\textrwidth\space (\the\textrwidth)
83   wider than the available total\MessageBreak
84   (Which is: \the\tempdimb). Please press X and try again.
85 }%
86 \fi
87 \oddsidemargin 1in
88 \evensidemargin 1in

```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```

89 \setlength\tempdima{\paperheight}
90 \addtolength\tempdima{-\footskip}
91 \addtolength\tempdima{-\headheight}
92 \addtolength\tempdima{-\headsep}
93 \setlength\tempdimb{\tempdima}
94 \addtolength\tempdima{-\textheight}
95 \divide\tempdima by 2
96 \ifdim \tempdima <2pc
97   \advance\tempdimb by -4pc
98   \settopoint\tempdimb
99   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{You
100  made your \string\textheight\space (\the\textheight)
101  more than the available total.\MessageBreak
102  (Which is: \the\tempdimb). Please press X and try again.
103 }%
104 \fi
105 \setlength\topmargin{0pt}
106 \setlength\id@boxheight{\tempdima}
107 \advance\id@boxheight by -2pc
108 }

109 \setlength\footnotesep{6.65\p@}
110 \setlength{\skip\footins}{9\p@ \oplus 4\p@ \minus 2\p@}

```

#### 1.4. LISTS

List default values

```

111 \setlength\partopsep{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{2em}
113 \setlength{\leftmarginii}{2.2em}

```

```

114 \setlength{\leftmarginiii}{1.87em}
115 \setlength{\leftmarginiv}{1.7em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 9\p@ \plus 3\p@ \minus 5\p@
124   \partopsep 3\p@ \plus 1\p@ \minus 2\p@
125   \itemsep 4.5\p@ \plus 2\p@ \minus 1\p@
126   \parsep 4.5\p@ \plus 2\p@ \minus 1\p@ }
127 \def\@listii{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \plus 2\p@ \minus 1\p@
132   \parsep 2\p@ \plus 1\p@ \minus 1\p@
133   \itemsep \parsep}
134 \def\@listiii{%
135   \leftmargin \leftmarginiii
136   \labelwidth \leftmarginiii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \plus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \plus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def\@listiv{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def\@listv{%
147   \setlength{\leftmargin}{\leftmarginv}%
148   \setlength{\labelwidth}{\leftmarginv}%
149   \addtolength{\labelwidth}{-\labelsep}}
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}}
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```
156 \setlength\floatsep{12\p@ \o@plus 2\p@ \o@minus 2\p@}
157 \setlength\textfloatsep{20\p@ \o@plus 2\p@ \o@minus 4\p@}
158 \setlength\intextsep{12\p@ \o@plus 2\p@ \o@minus 2\p@}
159 \setlength\dblfloatsep{12\p@ \o@plus 2\p@ \o@minus 2\p@}
160 \setlength\dbltextfloatsep{20\p@ \o@plus 2\p@ \o@minus 4\p@}
```

Separation on float pages

```
161 \setlength\@fptop{0\p@ \o@plus 1fil}
162 \setlength\@fpsep{8\p@ \o@plus 2fil}
163 \setlength\@fpbot{0\p@ \o@plus 1fil}
164 \setlength\@dblfpptop{0\p@ \o@plus 1fil}
165 \setlength\@dblfpsep{8\p@ \o@plus 2fil}
166 \setlength\@dblfpbot{0\p@ \o@plus 1fil}
167
168 \endinput
```

## klut10.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options. This is a the ‘tight’ file.

**Table of Contents**

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	3
1.3	Textheight and textwidth	3
1.4	Lists	4
1.5	Float separation parameters	5



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klut10.clo}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 5/6, 6/7, 7/8, 8/9, 9/10.5, 10/11.5, 12/14, 14/18, 17/22, 20/25, 25/30.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize\@xpt{11.5}%
4   \abovedisplayskip 10\p@ \oplus 2\p@ \ominus 5\p@
5   \abovedisplayshortskip \z@ \oplus 3\p@
6   \belowdisplayshortskip 6\p@ \oplus 3\p@ \ominus 3\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\@listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\@ixpt{10.5}%
12   \abovedisplayskip 8.5\p@ \oplus 3\p@ \ominus 4\p@
13   \abovedisplayshortskip \z@ \oplus 2\p@
14   \belowdisplayshortskip 4\p@ \oplus 2\p@ \ominus 2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 4\p@ \oplus 2\p@ \ominus 2\p@
17     \parsep 2\p@ \oplus \p@ \ominus \p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\@viiipt{9}%
23   \abovedisplayskip 6\p@ \oplus 2\p@ \ominus 4\p@
24   \abovedisplayshortskip \z@ \oplus \p@
25   \belowdisplayshortskip 3\p@ \oplus \p@ \ominus 2\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 3\p@ \oplus \p@ \ominus \p@
28     \parsep 2\p@ \oplus \p@ \ominus \p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{\@setfontsize\scriptsize\@viiipt\@viiipt}
33 \newcommand\little{\@setfontsize\little\@vpt\@viiipt}
34 \newcommand\tiny{\@setfontsize\tiny\@vpt\@vpt}
35 \newcommand\large{\@setfontsize\large\@xiipt\@xiipt}
36 \newcommand\Large{\@setfontsize\Large\@xivpt\@xivpt}
37 \newcommand\LARGE{\@setfontsize\LARGE\@xviipt\@xviipt}
38 \newcommand\huge{\@setfontsize\huge\@xxpt\@xxpt}
39 \newcommand\Huge{\@setfontsize\Huge\@xxvpt\@xxvpt}
```

## 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```

40 \setlength{\hoffset}{-1in}
41 \setlength{\voffset}{-1in}
42 \setlength{\parindent}{14\p@}
43 \setlength{\headheight}{12\p@}
44 \setlength{\headsep}{12\p@}
45 \setlength{\topskip}{10\p@}
46 \setlength{\footskip}{27.5\p@}
47 \setlength{\marginparsep}{10pt}
48 \setlength{\marginparpush}{5\p@}
49 \setlength{\maxdepth}{.5\topskip}
50 \setlength{\@maxdepth}{\maxdepth}
51 \setlength{\columnsep}{10pt}
52 \setlength{\columnseprule}{0pt}
53 \setlength{\fboxsep}{3pt}
54 \setlength{\fboxrule}{.4pt}
```

## 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘AtBeginDocument’ to allow changes made in the preamble and later on in the stylefile.

```

55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength{\@tempdima}{\paperwidth}%
58   \addtolength{\@tempdima}{-\textwidth}%
59   \divide{\@tempdima} by 2
60   \setlength{\@tempdimb}{\marginparwidth}
61   \addtolength{\@tempdimb}{\marginparsep}
62   \addtolength{\@tempdimb}{2pc}%
63   \ifdim \@tempdima < \@tempdimb
64     \GenericError{\Pointsize}{Pointsize Error: Marginpars disabled}{You made
65       your \string{textwidth} space (\the\textwidth) and
66       \string{marginparwidth} (\the\marginparwidth) too wide.\MessageBreak
67       The allowed value for margin space: (\the\@tempdima). Needed value:
68       (\the\@tempdimb).\MessageBreak
69       This is not enough,
70       so I will set \string{marginparwidth}space to 0pt.\MessageBreak
71       Let's hope that fixes it.
```

```

73   }%
74   \marginparwidth \z@
75   \marginparsep \z@
76 \fi
77 \ifdim \tempdima <2pc
78   \tempdimb=\paperwidth
79   \advance\tempdimb by -4pc
80   \settopoint\tempdimb
81   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{You
82   made your \string\textrwidth\space (\the\textrwidth)
83   wider than the available total\MessageBreak
84   (Which is: \the\tempdimb). Please press X and try again.
85 }%
86 \fi
87 \oddsidemargin \tempdima
88 \evensidemargin \tempdima

```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```

89 \setlength\tempdima{\paperheight}
90 \addtolength\tempdima{-\footskip}
91 \addtolength\tempdima{-\headheight}
92 \addtolength\tempdima{-\headsep}
93 \setlength\tempdimb{\tempdima}
94 \addtolength\tempdima{-\textheight}
95 \divide\tempdima by 2
96 \ifdim \tempdima <2pc
97   \advance\tempdimb by -4pc
98   \settopoint\tempdimb
99   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{You
100  made your \string\textheight\space (\the\textheight)
101  more than the available total.\MessageBreak
102  (Which is: \the\tempdimb). Please press X and try again.
103 }%
104 \fi
105 \setlength\topmargin{\tempdima}
106 \setlength\id@boxheight{\tempdima}
107 \advance\id@boxheight by -2pc
108 }

109 \setlength\footnotesep{6.65\p@}
110 \setlength{\skip\footins}{9\p@ \oplus 4\p@ \minus 2\p@}

```

#### 1.4. LISTS

List default values

```

111 \setlength\partopsep{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{2em}
113 \setlength{\leftmarginii}{2.2em}

```

```

114 \setlength{\leftmarginiii}{1.87em}
115 \setlength{\leftmarginiv}{1.7em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 9\p@ \plus 3\p@ \minus 5\p@
124   \partopsep 3\p@ \plus 1\p@ \minus 2\p@
125   \itemsep 4.5\p@ \plus 2\p@ \minus 1\p@
126   \parsep 4.5\p@ \plus 2\p@ \minus 1\p@ }
127 \def\@listii{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \plus 2\p@ \minus 1\p@
132   \parsep 2\p@ \plus 1\p@ \minus 1\p@
133   \itemsep \parsep}
134 \def\@listiii{%
135   \leftmargin \leftmarginiii
136   \labelwidth \leftmarginiii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \plus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \plus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def\@listiv{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def\@listv{%
147   \setlength{\leftmargin}{\leftmarginv}%
148   \setlength{\labelwidth}{\leftmarginv}%
149   \addtolength{\labelwidth}{-\labelsep}}
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}}
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```
156 \setlength\floatep{12\p@ \oplus 2\p@ \ominus 2\p@}
157 \setlength\textfloatsep{20\p@ \oplus 2\p@ \ominus 4\p@}
158 \setlength\intextsep{12\p@ \oplus 2\p@ \ominus 2\p@}
159 \setlength\dblfloatsep{12\p@ \oplus 2\p@ \ominus 2\p@}
160 \setlength\dbltextfloatsep{20\p@ \oplus 2\p@ \ominus 4\p@}
```

Separation on float pages

```
161 \setlength\cftpsep{0\p@ \oplus 1fil}
162 \setlength\cfpsep{8\p@ \oplus 2fil}
163 \setlength\cfpbot{0\p@ \oplus 1fil}
164 \setlength\cdblfptop{0\p@ \oplus 1fil}
165 \setlength\cdblfpsep{8\p@ \oplus 2fil}
166 \setlength\cdblfpbot{0\p@ \oplus 1fil}
167
168 \endinput
```

# klut11.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options. This is a the ‘tight’ file.

## Table of Contents

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	3
1.3	Textheight and textwidth	3
1.4	Lists	5
1.5	Float separation parameters	6



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klut11.clo}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 6/7, 7/8, 8/9, 9/10.5, 10/11.5, 11/12.5, 12/14, 14/18, 17/22, 20/25, 25/30.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize\xipt{12.5}%
4   \abovedisplayskip 10\p@ \plus 2\p@ \minus 5\p@
5   \abovedisplayshortskip \z@ \plus 3\p@
6   \belowdisplayshortskip 6\p@ \plus 3\p@ \minus 3\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\@listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\xpt{11.5}%
12   \abovedisplayskip 9\p@ \plus 3\p@ \minus 4\p@
13   \abovedisplayshortskip \z@ \plus 2\p@
14   \belowdisplayshortskip 5\p@ \plus 2\p@ \minus 2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 4\p@ \plus 2\p@ \minus 2\p@
17     \parsep 2\p@ \plus \p@ \minus \p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\xipt{10.5}%
23   \abovedisplayskip 6\p@ \plus 2\p@ \minus 4\p@
24   \abovedisplayshortskip \z@ \plus \p@
25   \belowdisplayshortskip 3\p@ \plus \p@ \minus 2\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 3\p@ \plus \p@ \minus \p@
28     \parsep 2\p@ \plus \p@ \minus \p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{\@setfontsize\scriptsize\xiiipt{9.5}}
33 \newcommand\little{\@setfontsize\little\xipt\xiiipt}
34 \newcommand\tiny{\@setfontsize\tiny\xipt\xiiipt}
35 \newcommand\large{\@setfontsize\large\xiipt{14}}
36 \newcommand\Large{\@setfontsize\Large\xivpt{18}}
37 \newcommand\LARGE{\@setfontsize\LARGE\xviiipt{22}}
38 \newcommand\huge{\@setfontsize\huge\xxpt{25}}
```

```
39 \newcommand{\Huge}{\@setfontsize{\Huge}{xxvpt}{30}}
```

## 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
40 \setlength{\hoffset}{-1in}
41 \setlength{\voffset}{-1in}
42 \setlength{\parindent}{14\p@}
43 \setlength{\headheight}{12\p@}
44 \setlength{\headsep}{12\p@}
45 \setlength{\topskip}{10\p@}
46 \setlength{\footskip}{27.5\p@}
47 \setlength{\marginparsep}{10pt}
48 \setlength{\marginparpush}{5\p@}
49 \setlength{\maxdepth}{.5\topskip}
50 \setlength{\@maxdepth}{\maxdepth}
51 \setlength{\columnsep}{10pt}
52 \setlength{\columnseprule}{0pt}
53 \setlength{\fboxsep}{3pt}
54 \setlength{\fboxrule}{.4pt}
```

## 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘AtBeginDocument’ to allow changes made in the preamble and later on in the stylefile.

```
55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength{\tempdima}{\paperwidth}%
58   \addtolength{\tempdima}{-\textwidth}%
59   \divide{\tempdima}{2}
60   \setlength{\tempdimb}{\marginparwidth}
61   \addtolength{\tempdimb}{\marginparsep}
62   \addtolength{\tempdimb}{2pc}%
63   \ifdim \tempdima < \tempdimb
64     \settoint{\tempdimb}
65     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made}
```

```

66   your \string\textwidth\space (\the\textwidth) and
67   \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
68   The allowed value for margin space: (\the\@tempdima). Needed value:
69   (\the\@tempdimb).\MessageBreak
70   This is not enough,
71   so I will set \string\marginparwidth\space to Opt.\MessageBreak
72   Let's hope that fixes it.
73 }%
74 \marginparwidth \z@
75 \marginparsep \z@
76 \fi
77 \ifdim \@tempdima <2pc
78   \@tempdimb=\paperwidth
79   \advance\@tempdimb by -4pc
80   \settodepth{\@tempdimb}
81   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
82   made your \string\textwidth\space (\the\textwidth)
83   wider than the available total.\MessageBreak
84   (Which is: \the\@tempdimb). Please press X and try again.
85 }%
86 \fi
87 \oddsidemargin \@tempdima
88 \evensidemargin \@tempdima

```

These calculations are a lot easier. `\textheight` should have been set already.  
This does not check for the correct placement of the identification line!!

```

89 \setlength{\@tempdima}{\paperheight}
90 \addtolength{\@tempdima}{-\footskip}
91 \addtolength{\@tempdima}{-\headheight}
92 \addtolength{\@tempdima}{-\headsep}
93 \setlength{\@tempdimb}{\@tempdima}
94 \addtolength{\@tempdima}{-\textheight}
95 \divide{\@tempdima}{2}
96 \ifdim \@tempdima <2pc
97   \advance\@tempdimb by -4pc
98   \settodepth{\@tempdimb}
99   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
100  made your \string\textheight\space (\the\textheight)
101  more than the available total.\MessageBreak
102  (Which is: \the\@tempdimb). Please press X and try again.
103 }%
104 \fi
105 \setlength{\topmargin}{\@tempdima}
106 \setlength{\id@boxheight}{\@tempdima}
107 \advance\id@boxheight by -2pc
108 }

```

```

109 \setlength{\footnotesep}{6.65\p@}
110 \setlength{\skip\footins}{9\p@ \oplus 4\p@ \minus 2\p@}

```

#### 1.4. LISTS

List default values

```

111 \setlength{\partopsep}{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{2em}
113 \setlength{\leftmarginii}{2.2em}
114 \setlength{\leftmarginiii}{1.87em}
115 \setlength{\leftmarginiv}{1.7em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def@\listI{%
122   \leftmargin \leftmargini
123   \topsep 9\p@ \oplus 3\p@ \minus 5\p@
124   \partopsep 3\p@ \oplus 1\p@ \minus 2\p@
125   \itemsep 4.5\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 4.5\p@ \oplus 2\p@ \minus 1\p@ }
127 \def@\listII{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 2\p@ \oplus 1\p@ \minus 1\p@
133   \itemsep \parsep}
134 \def@\listIII{%
135   \leftmargin \leftmarginiii
136   \labelwidth \leftmarginiii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \oplus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \oplus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def@\listIV{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def@\listV{%

```

```

147 \setlength{\leftmargin}{\leftmargininv}%
148 \setlength{\labelwidth}{\leftmargininv}%
149 \addtolength{\labelwidth}{-\labelsep}%
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}%
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```

156 \setlength\floatsep{12\p@ \cplus 2\p@ \cminus 2\p@}
157 \setlength\textfloatsep{20\p@ \cplus 2\p@ \cminus 4\p@}
158 \setlength\intextsep{12\p@ \cplus 2\p@ \cminus 2\p@}
159 \setlength\dblfloatsep{12\p@ \cplus 2\p@ \cminus 2\p@}
160 \setlength\dbltextfloatsep{20\p@ \cplus 2\p@ \cminus 4\p@}

```

Separation on float pages

```

161 \setlength\@fptop{0\p@ \cplus 1fil}
162 \setlength\@fpsep{8\p@ \cplus 2fil}
163 \setlength\@fpbot{0\p@ \cplus 1fil}
164 \setlength\@dblfpptop{0\p@ \cplus 1fil}
165 \setlength\@dblfpsep{8\p@ \cplus 2fil}
166 \setlength\@dblfpbot{0\p@ \cplus 1fil}
167
168 \endinput

```

## klut12.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options. This is a tight version.

**Table of Contents**

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	3
1.3	Textheight and textwidth	3
1.4	Lists	5
1.5	Float separation parameters	6



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klut12.clo}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 6/7, 8/9, 9/10.5, 10/11.5, 11/12.5 12/13.5, 14/18, 17/22, 20/25, 25/30.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize\cxipt{13.5}%
4   \abovedisplayskip 11\p@ \oplus 2\p@ \minus 5\p@
5   \abovedisplayshortskip 1\p@ \oplus 3\p@
6   \belowdisplayshortskip 7\p@ \oplus 3\p@ \minus 3\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\@listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\cxipt{12.5}%
12   \abovedisplayskip 8.5\p@ \oplus 3\p@ \minus 4\p@
13   \abovedisplayshortskip \z@ \oplus 2\p@
14   \belowdisplayshortskip 4\p@ \oplus 2\p@ \minus 2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 4\p@ \oplus 2\p@ \minus 2\p@
17     \parsep 2\p@ \oplus \p@ \minus \p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\cxipt{11.5}%
23   \abovedisplayskip 6\p@ \oplus 2\p@ \minus 4\p@
24   \abovedisplayshortskip \z@ \oplus \p@
25   \belowdisplayshortskip 3\p@ \oplus \p@ \minus 2\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 3\p@ \oplus \p@ \minus \p@
28     \parsep 2\p@ \oplus \p@ \minus \p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{\@setfontsize\scriptsize\cxipt{10.5}}
33 \newcommand\little{\@setfontsize\little\cxipt{9}}
34 \newcommand\tiny{\@setfontsize\tiny\cxipt{9}}
```

```

35 \newcommand\large{\@setfontsize\large\@xivpt{18}}
36 \newcommand\Large{\@setfontsize\Large\@xviipt{22}}
37 \newcommand\LARGE{\@setfontsize\LARGE\@xxipt{25}}
38 \newcommand\huge{\@setfontsize\huge\@xxxipt{30}}
39 \newcommand\Huge{\@setfontsize\Huge\@xxvpt{30}}

```

## 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```

40 \setlength\hoffset{-1in}
41 \setlength\voffset{-1in}
42 \setlength\parindent {14\p@}
43 \setlength\headheight{12\p@}
44 \setlength\headsep   {12\p@}
45 \setlength\topskip  {10\p@}
46 \setlength\footskip {27.5\p@}
47 \setlength\marginparsep{10pt}
48 \setlength\marginparpush{5\p@}
49 \setlength\maxdepth {.5\topskip}
50 \setlength\@maxdepth\maxdepth
51 \setlength\columnsep{12pt}
52 \setlength\columnseprule{0pt}
53 \setlength\fboxsep{3pt}
54 \setlength\fboxrule{.4pt}

```

## 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘AtBeginDocument’ to allow changes made in the preamble and later on in the stylefile.

```

55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength\@tempdima{\paperwidth}%
58   \addtolength\@tempdima{-\textwidth}%

```

```

59  \divide\@tempdima by 2
60  \setlength\@tempdimb\marginparwidth
61  \addtolength\@tempdimb\marginparsep
62  \addtolength\@tempdimb{2pc}%
63  \ifdim \@tempdima <\@tempdimb
64    \@settopoint\@tempdimb
65    \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made
66      your \string\textwidth\space (\the\textwidth) and
67      \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
68      The allowed value for margin space: (\the\@tempdima). Needed value:
69      (\the\@tempdimb).\MessageBreak
70      This is not enough,
71      so I will set \string\marginparwidth\space to Opt.\MessageBreak
72      Let's hope that fixes it.
73    }%
74    \marginparwidth \z@
75    \marginparsep \z@
76  \fi
77  \ifdim \@tempdima <2pc
78    \@tempdimb=\paperwidth
79    \advance\@tempdimb by -4pc
80    \@settopoint\@tempdimb
81    \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
82      made your \string\textwidth\space (\the\textwidth)
83      wider than the available total\MessageBreak
84      (Which is: \the\@tempdimb). Please press X and try again.
85    }%
86  \fi
87  \oddsidemargin \@tempdima
88  \evensidemargin \@tempdima

```

These calculations are a lot easier. `\textheight` should have been set already. This does not check for the correct placement of the identification line!!

```

89  \setlength\@tempdima{\paperheight}
90  \addtolength\@tempdima{-\footskip}
91  \addtolength\@tempdima{-\headheight}
92  \addtolength\@tempdima{-\headsep}
93  \setlength\@tempdimb{\@tempdima}
94  \addtolength\@tempdimb{-\textheight}
95  \divide\@tempdima by 2
96  \ifdim \@tempdima <2pc
97  \advance\@tempdimb by -4pc
98  \@settopoint\@tempdimb

```

```

99      \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
100     made your \string\textheight\space (\the\textheight)
101     more than the available total.\MessageBreak
102     (Which is: \the\@tempdima). Please press X and try again.
103   }%
104 \fi
105 \setlength\topmargin{\@tempdima}
106 \setlength\id@boxheight{\@tempdima}
107 \advance\id@boxheight by -2pc
108 }

109 \setlength\footnotesep{6.65\p@}
110 \setlength{\skip\footins}{12\p@ \oplus 4\p@ \minus 2\p@}

```

## 1.4. LISTS

List default values

```

111 \setlength\partopsep{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{2em}
113 \setlength{\leftmarginii}{2.2em}
114 \setlength{\leftmarginiii}{1.87em}
115 \setlength{\leftmarginiv}{1.7em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def\@listI{%
122   \leftmargin \leftmargini
123   \topsep 11\p@ \oplus 3\p@ \minus 5\p@
124   \partopsep 4.5\p@ \oplus 1\p@ \minus 2\p@
125   \itemsep 6\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 6\p@ \oplus 2\p@ \minus 1\p@ }
127 \def\@listII{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 6\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 3\p@ \oplus 1\p@ \minus 1\p@ }

```

```

133 \itemsep \parsep}
134 \def\@listiii{%
135   \leftmargin \leftmarginiii
136   \labelwidth \leftmarginiii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \oplus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \oplus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def\@listiv{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def\@listv{%
147   \setlength{\leftmargin}{\leftmarginv}%
148   \setlength{\labelwidth}{\leftmarginv}%
149   \addtolength{\labelwidth}{-\labelsep}}
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}}
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```

156 \setlength\floatsep{12\p@ \oplus 2\p@ \minus 2\p@}
157 \setlength\textfloatsep{24\p@ \oplus 2\p@ \minus 4\p@}
158 \setlength\intextsep{12\p@ \oplus 2\p@ \minus 2\p@}
159 \setlength\dblfloatsep{12\p@ \oplus 2\p@ \minus 2\p@}
160 \setlength\dbltextfloatsep{24\p@ \oplus 2\p@ \minus 4\p@}

```

Separation on float pages

```

161 \setlength\fptop{0\p@ \oplus 1fil}
162 \setlength\fpsep{10\p@ \oplus 2fil}
163 \setlength\fpbot{0\p@ \oplus 1fil}
164 \setlength\dblfptop{0\p@ \oplus 1fil}
165 \setlength\dblfpsep{10\p@ \oplus 2fil}
166 \setlength\dblfpbot{0\p@ \oplus 1fil}
167
168 \endinput

```

## klu105.clo

Kluwer Academic Publishers

1998/02/11

**Abstract.** This internal file takes care of list definitions and ‘general’ point size options.**Table of Contents**

1	Implementation	2
1.1	Section size commands	2
1.2	Various values	3
1.3	Textheight and textwidth	3
1.4	Lists	5
1.5	Float separation parameters	6



© 2008 Kluwer Academic Publishers. Printed in the Netherlands.

## 1. Implementation

```
1 \ProvidesFile{klu105.clo}[\filedate ]
```

### 1.1. SECTION SIZE COMMANDS

added command: `\little`. This between `\scriptsize` and `\tiny`. Allowed type provided values: 6/7, 7/8, 9/11, 10/11.5, 10.5/12, 11/13, 12/14, 14/18, 17/22, 20/25, 25/30.

```
2 \renewcommand\normalsize{%
3   \@setfontsize\normalsize{10.5pt}{12}%
4   \abovedisplayskip 10\p@ \plus 2\p@ \minus 5\p@
5   \abovedisplayshortskip \z@ \plus 3\p@
6   \belowdisplayshortskip 6\p@ \plus 3\p@ \minus 3\p@
7   \belowdisplayskip \abovedisplayskip
8   \let\@listi\@listI}
9 \normalsize
10 \newcommand\small{%
11   \@setfontsize\small\@xpt{11.5}%
12   \abovedisplayskip 9\p@ \plus 3\p@ \minus 4\p@
13   \abovedisplayshortskip \z@ \plus 2\p@
14   \belowdisplayshortskip 5\p@ \plus 2\p@ \minus 2\p@
15   \def\@listi{\leftmargin\leftmargini
16     \topsep 4\p@ \plus 2\p@ \minus 2\p@
17     \parsep 2\p@ \plus \p@ \minus \p@
18     \itemsep \parsep}%
19   \belowdisplayskip \abovedisplayskip
20 }
21 \newcommand\footnotesize{%
22   \@setfontsize\footnotesize\@ixpt\@xipt
23   \abovedisplayskip 6\p@ \plus 2\p@ \minus 4\p@
24   \abovedisplayshortskip \z@ \plus \p@
25   \belowdisplayshortskip 3\p@ \plus \p@ \minus 2\p@
26   \def\@listi{\leftmargin\leftmargini
27     \topsep 3\p@ \plus \p@ \minus \p@
28     \parsep 2\p@ \plus \p@ \minus \p@
29     \itemsep \parsep}%
30   \belowdisplayskip \abovedisplayskip
31 }
32 \newcommand\scriptsize{\@setfontsize\scriptsize\@viiipt{9.5}}
33 \newcommand\little{\@setfontsize\little\@vipt\@viiipt}
34 \newcommand\tiny{\@setfontsize\tiny\@viipt\@viiipt}
35 \newcommand\large{\@setfontsize\large\@xiipt{14}}
36 \newcommand\Large{\@setfontsize\Large\@xivipt{18}}
37 \newcommand\LARGE{\@setfontsize\LARGE\@xviipt{22}}
38 \newcommand\huge{\@setfontsize\huge\@xxipt{25}}
```

```
39 \newcommand{\Huge}{\@setfontsize{\Huge}{xxvpt}{30}}
```

## 1.2. VARIOUS VALUES

Note that `\hoffset` and `\voffset` are both compensated. This makes the calculations below easier.

```
40 \setlength{\hoffset}{-1in}
41 \setlength{\voffset}{-1in}
42 \setlength{\parindent}{14\p@}
43 \setlength{\headheight}{12\p@}
44 \setlength{\headsep}{13\p@}
45 \setlength{\topskip}{10\p@}
46 \setlength{\footskip}{27.5\p@}
47 \setlength{\marginparsep}{10pt}
48 \setlength{\marginparpush}{5\p@}
49 \setlength{\maxdepth}{.5\topskip}
50 \setlength{\@maxdepth}{\maxdepth}
51 \setlength{\columnsep}{10pt}
52 \setlength{\columnseprule}{0pt}
53 \setlength{\fboxsep}{3pt}
54 \setlength{\fboxrule}{.4pt}
```

## 1.3. TEXTHEIGHT AND TEXTWIDTH

These are the main reason for the existence of these files. For some stupid reason, L<sup>A</sup>T<sub>E</sub>X calculates `textwidth` out of `\paperwidth`. We did want to support letter paper, but our `\textwidth` is fixed, with the margins being calculated.

Presume `\textwidth` and `\marginparwidth` are set in the stylefile, or we're in trouble. The `2pc` value is used to compensate for the ‘dead’ corners in most laserprinters.

Calculations are done ‘AtBeginDocument’ to allow changes made in the preamble and later on in the stylefile.

```
55 \newdimen\id@boxheight
56 \AtBeginDocument{%
57   \setlength{\tempdima}{\paperwidth}%
58   \addtolength{\tempdima}{-\textwidth}%
59   \divide{\tempdima}{2}
60   \setlength{\tempdimb}{\marginparwidth}
61   \addtolength{\tempdimb}{\marginparsep}
62   \addtolength{\tempdimb}{2pc}%
63   \ifdim \tempdima < \tempdimb
64     \settoint{\tempdimb}
65     \GenericError{Pointsize}{Pointsize Error: Marginpars disabled}{}{You made}
```

```

66  your \string\textwidth\space (\the\textwidth) and
67  \string\marginparwidth (\the\marginparwidth) too wide.\MessageBreak
68  The allowed value for margin space: (\the\@tempdima). Needed value:
69  (\the\@tempdimb).\MessageBreak
70  This is not enough,
71  so I will set \string\marginparwidth\space to Opt.\MessageBreak
72  Let's hope that fixes it.
73 }%
74 \marginparwidth \z@
75 \marginparsep \z@
76 \fi
77 \ifdim \@tempdima <2pc
78   \@tempdimb=\paperwidth
79   \advance\@tempdimb by -4pc
80   \settodepth{\@tempdimb}
81   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
82   made your \string\textwidth\space (\the\textwidth)
83   wider than the available total.\MessageBreak
84   (Which is: \the\@tempdimb). Please press X and try again.
85 }%
86 \fi
87 \oddsidemargin \@tempdima
88 \evensidemargin \@tempdima

```

These calculations are a lot easier. `\textheight` should have been set already.  
This does not check for the correct placement of the identification line!!

```

89 \setlength{\@tempdima}{\paperheight}
90 \addtolength{\@tempdima}{-\footskip}
91 \addtolength{\@tempdima}{-\headheight}
92 \addtolength{\@tempdima}{-\headsep}
93 \setlength{\@tempdimb}{\@tempdima}
94 \addtolength{\@tempdima}{-\textheight}
95 \divide{\@tempdima}{2}
96 \ifdim \@tempdima <2pc
97   \advance\@tempdimb by -4pc
98   \settodepth{\@tempdimb}
99   \GenericError{Pointsize}{Pointsize Error: Invalid sizes given}{}{You
100  made your \string\textheight\space (\the\textheight)
101  more than the available total.\MessageBreak
102  (Which is: \the\@tempdimb). Please press X and try again.
103 }%
104 \fi
105 \setlength{\topmargin}{\@tempdima}
106 \setlength{\id@boxheight}{\@tempdima}
107 \advance\id@boxheight by -2pc
108 }

```

```

109 \setlength{\footnotesep}{6.65\p@}
110 \setlength{\skip\footins}{9\p@ \oplus 4\p@ \minus 2\p@}

```

#### 1.4. LISTS

List default values

```

111 \setlength{\partopsep}{2\p@ \oplus 1\p@ \minus 1\p@}
112 \setlength{\leftmargini}{2em}
113 \setlength{\leftmarginii}{2.2em}
114 \setlength{\leftmarginiii}{1.87em}
115 \setlength{\leftmarginiv}{1.7em}
116 \setlength{\leftmarginv}{1em}
117 \setlength{\leftmarginvi}{1em}
118 \setlength{\labelsep}{.4em}
119 \setlength{\labelwidth}{\leftmargini}
120 \addtolength{\labelwidth}{-\labelsep}

```

Note that lists below level 3 do nothing else then readjusting the `\labelwidth`. This results in very small labels for the inner lists.

```

121 \def@\listI{%
122   \leftmargin \leftmargini
123   \topsep 9\p@ \oplus 3\p@ \minus 5\p@
124   \partopsep 3\p@ \oplus 1\p@ \minus 2\p@
125   \itemsep 4.5\p@ \oplus 2\p@ \minus 1\p@
126   \parsep 4.5\p@ \oplus 2\p@ \minus 1\p@ }
127 \def@\listII{%
128   \leftmargin \leftmarginii
129   \labelwidth \leftmarginii
130   \advance\labelwidth by -\labelsep
131   \topsep 4.5\p@ \oplus 2\p@ \minus 1\p@
132   \parsep 2\p@ \oplus 1\p@ \minus 1\p@
133   \itemsep \parsep}
134 \def@\listIII{%
135   \leftmargin \leftmarginiii
136   \labelwidth \leftmarginiii
137   \advance\labelwidth by -\labelsep
138   \topsep 2\p@ \oplus 1\p@ \minus 1\p@
139   \parsep \z@
140   \partopsep 1\p@ \oplus 0\p@ \minus 1\p@
141   \itemsep \topsep}
142 \def@\listIV{%
143   \setlength{\leftmargin}{\leftmarginiv}%
144   \setlength{\labelwidth}{\leftmarginiv}%
145   \addtolength{\labelwidth}{-\labelsep}}
146 \def@\listV{%

```

```

147 \setlength{\leftmargin}{\leftmargininv}%
148 \setlength{\labelwidth}{\leftmargininv}%
149 \addtolength{\labelwidth}{-\labelsep}%
150 \def\@listvi{%
151   \setlength{\leftmargin}{\leftmarginvi}%
152   \setlength{\labelwidth}{\leftmarginvi}%
153   \addtolength{\labelwidth}{-\labelsep}%
154 \let\@listi\@listI
155 \@listi

```

## 1.5. FLOAT SEPARATION PARAMETERS

Separation on text pages.

```

156 \setlength\floatsep{12\p@ \cplus 2\p@ \cminus 2\p@}
157 \setlength\textfloatsep{20\p@ \cplus 2\p@ \cminus 4\p@}
158 \setlength\intextsep{12\p@ \cplus 2\p@ \cminus 2\p@}
159 \setlength\dblfloatsep{12\p@ \cplus 2\p@ \cminus 2\p@}
160 \setlength\dbltextfloatsep{20\p@ \cplus 2\p@ \cminus 4\p@}

```

Separation on float pages

```

161 \setlength\@fptop{0\p@ \cplus 1fil}
162 \setlength\@fpsep{8\p@ \cplus 2fil}
163 \setlength\@fpbot{0\p@ \cplus 1fil}
164 \setlength\@dblfpptop{0\p@ \cplus 1fil}
165 \setlength\@dblfpsep{8\p@ \cplus 2fil}
166 \setlength\@dblfpbot{0\p@ \cplus 1fil}
167
168 \endinput

```